IN THE CLAIMS

Please insert all pending claims including their status here.

1. (Original) A computer implemented method, comprising:

in a normal power state, directly storing pixels of a color plane of image data in a first segment and a second segment of a frame buffer;

in a low power state, performing an error diffusion operation on the pixels to reduce a color depth of the pixels, the normal and low power states are independent and switchable from each other; and

storing at least a portion of the pixels with reduced color depth in the first segment of the frame buffer without accessing the second segment of the frame buffer during the low power state.

2. (Original) The method of claim 1, further comprising reducing power to the second segment of the frame buffer during the low power state.

3. (Original) The method of claim 1, further comprising:

during the normal power state, fetching the pixels from the first and second segments of the frame buffer for display; and

during the low power state, fetching the pixels with reduced color depth from the first segment of the frame buffer for display without accessing the second segment of the frame buffer.

4. (Original) The method of claim 3, wherein the first segment is a most significant device (MSD) of the frame buffer and the second segment is a least significant device (LSD) of the frame buffer.

5. (Original) The method of claim 4, wherein during the low power state, pixels with reduced color depth are used as data associated with the MSD for display while a predetermined value is used as data associated with the LSD for display without accessing the LSD of the frame buffer.

6. (Original) The method of claim 1, wherein performing an error diffusion operation on the pixels comprises:

for each source pixel of each color plane of the image data, calculating an output value corresponding to a source pixel value of the source pixel according to a predetermined algorithm;

calculating an error between the output value and the source pixel value; and

diffusing the error to up to two neighboring pixels of the source pixel.

7. (Original) The method of claim 6, wherein the up to two neighboring pixels are a right pixel and a bottom pixel of the source pixel.

8. (Original) The method of claim 6, wherein diffusing the error to up to two neighboring pixels comprises adjusting pixel values of the up to two neighboring pixels with at least a portion of the error, wherein the portion of the error diffused to the neighboring pixel in an identical row is temporarily stored in a register and a portion of the error diffused to the neighboring pixel in a next row is temporarily stored in a line buffer.

9. (Original) The method of claim 6, further comprising reducing color bits of each pixel with reduced color depth to fit within the first segment of the frame buffer prior to storing each pixel in the first segment of the frame buffer.

10. (Original) The method of claim 9, wherein reducing color bits of each pixel with reduced color depth comprises:

for each pixel of a color plane, arithmetically adding the error diffused from up to two neighboring pixels to an original value of a pixel, and

storing a predetermined number of most significant bits (MSBs) of the output value in the first segment of the frame buffer.

11. (Original) The method of claim 1, wherein the error diffusion operation is performed by an encoder implemented within at least one of software, a display controller, and a chipset of a data processing system.

12. (Original) A machine-readable medium for storing instructions, when executed by a machine, cause the machine to perform a method, the method comprising:

in a normal power state, directly storing pixels of a color plane of image data in a first segment and a second segment of a frame buffer;

in a low power state, performing an error diffusion operation on the pixels to reduce a color depth of the pixels, the normal and low power states being independent and switchable from each other; and

storing at least a portion of the pixels with reduced color depth in the first segment of the frame buffer during the low power state without accessing the second segment of the frame buffer.

13. (Original) The machine-readable medium of claim 12, wherein performing an error diffusion operation on the pixels comprises:

for each source pixel of each color plane of the image data, calculating an output value corresponding to a source pixel value of the source pixel according to a predetermined algorithm;

calculating an error between the output value and the source pixel value; and

diffusing the error to up to two neighboring pixels of the source pixel.

14. (Original) The machine-readable medium of claim 13, wherein the method further comprises reducing color bits of each pixel with reduced color depth to fit within the first segment of the frame buffer prior to storing each pixel in the first segment of the frame buffer, including

for each pixel of a color plane, arithmetically adding the error diffused from up to two neighboring pixels to an original value of a pixel, and

storing a predetermined number of most significant bits (MSBs) of the output value in the first segment of the frame buffer.

15. (Original) A data processing system, comprising:

a display subsystem including

a frame buffer having a first segment and a second segment,

an encoder coupled to the frame buffer and configured to

store pixels of a color plane of image data in the first and second segments of the frame buffer during a normal power state,

perform an error diffusion operation on the pixels to reduce a color depth of the pixels during a low power state, the normal and low power states being independent and switchable from each other, and

store at least a portion of the pixels with reduced color depth in the first segment of the frame buffer during the low power state without accessing the second segment of the frame buffer.

16. (Original) The system of claim 15, wherein during performing an error diffusion operation on the pixels, the encoder is further configured to:

for each source pixel of each color plane of the image data, calculate an output value corresponding to a source pixel value of the source pixel according to a predetermined algorithm,

calculate an error between the output value and the source pixel value, and

diffuse the error to up to two neighboring pixels of the source pixel.

17. (Original) The system of claim 16, wherein the encoder is further configured to reduce color bits of each pixel with reduced color depth to fit within the first segment of the frame buffer prior to storing each pixel in the first segment of the frame buffer, including

for each pixel of a color plane, arithmetically adding the error diffused from up to two neighboring pixels to an original value of a pixel, and

storing a predetermined number of most significant bits (MSBs) of the output value in the first segment of the frame buffer.

18. (Original) A computer implemented method, comprising:

during a low power state of a frame buffer having a first segment and a second segment, for each source pixel of each color plane of image data, calculating an output value corresponding to a source pixel value of the source pixel according to a predetermined algorithm;

calculating an error between the output value and the source pixel value;

diffusing the error to up to two neighboring pixels of the source pixel; and

storing the output value of the source pixel and the diffused up to two neighboring pixels to the first segment of the frame buffer without accessing the second segment of the frame buffer during the low power state of the frame buffer.

19. (Original) The method of claim 18, further comprising reducing color bits of each output value and the up to two neighboring pixels to fit within the first segment of the frame buffer before being stored in the first segment of the frame buffer.

20. (Original) The method of claim 19, wherein reducing color bits comprises:

for each pixel of a color plane, arithmetically adding the error diffused from up to two neighboring pixels to an original value of a pixel, and

storing a predetermined number of most significant bits (MSBs) of the output value in the first segment of the frame buffer.